PATENT SPECIFICATION

902,650

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International Classification:—E01f.

COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Improvements in Manhole or Like Covers and Frames

We, BROADS MANUFACTURING COMPANY LIMITED, a British Company, of 4 South Wharf, Paddington, London, W.2, and GERALD ROBINSON, a British Subject, of the Company's address, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to improvements in manhole or like covers and frames.

It has been proposed to form a manhole or the like access cover and supporting frame from metal sheet in order to make them light in weight and easy to manufacture by pressing or rolling. It has also been proposed to form a manhole or like access cover which can be filled with any desired material or infill in order to blend with the surrounding floor or like surface in which said cover and frame are situated.

The present invention is concerned with providing a cover and frame of the aforementioned kind in which the cover can be filled with said infill while it is in position in its supporting frame, the present invention constituting an improvement to the frame and cover described in our earlier U.K. Patent No. 606,014.

According to the present invention in a manhole or like cover and supporting frame said frame is in the form of a closed figure and has one or more of its sides downwardly and inwardly inclined towards the centre thereof and of corrugated cross-section and said cover is of a similar shape and is in the form of a tray having the side or sides corresponding to the said corrugated side or sides of said frame also similarly downwardly and inwardly inclined towards the centre thereof and similarly corrugated to allow said cover to nest in said frame without rocking, said cover having a substantially flat base to support an infill material, and said cover and frame being formed from metal plate by rolling or pressing, the upper portions of the sides of said cover and frame being substantially upright so that only the narrow edge of said metal plate comprising said sides is visible when said cover is filled with said infill material.

How the invention may be carried out will now be particularly described by way of example only and with reference to the accompanying drawings in which:—

Figure 1 is a plan view of one cover and frame embodying the invention;

Figure 2 is a fragmentary cross-section taken on the line 2-2 of Figure 1;

Figure 3 is a plan view of another cover and frame embodying the invention;

Figure 4 is a fragmentary cross-section taken on the line 4-4 of Figure 3, and

Figure 5 is a fragmentary cross-section on the line 5-5 of Figure 3.

Referring to Figures 1 and 2, the supporting frame 1 is rectangular and has its sides 2 sloping downwardly and inwardly towards the opening around which the frame 1 is to be located, the sides 2 being of corrugated cross-section, as shown in Figure 2, with the upper portion 3 of each side substantially upright. The four sides 2 of the frame 1 are pressed from steel plate and are welded together at the corners. The frame 1 has a plate 4 welded horizontally across the underneath of each corner to act as an anchoring member to anchor the frame in the concrete floor or the like in which it is to be located. Other forms of anchoring member may be employed, such as rods welded in the form of feet at each corner.

The cover 5 is in the form of a rectangular tray having sides 6 of a similar corrugated cross-section to the sides 2 of the supporting frame 1 so that the cover nests in the frame

without rocking. The cover 5 has a flat base 36 to support the material or infill with which the cover is to be filled. The cover rests in the frame so that there is a space 7 between the two for grease to provide an airtight seal between the cover and frame. The upper portions 8 of the sides of the cover are substantially upright and close to the outer edges 3 of the frame 1 when the cover is in position in the frame. The cover 5 has a number of rods 9 extending across the base 36 and spaced apart therefrom to provide keying for the infill material. The cover is provided with a pair of lifting bosses 10 each comprising an upright tubular member 11 which is welded to the base 36 of the cover and has a slot 12 near its upper end, which slot is shaped to allow a lifting key to be inserted therein which when turned to bear against the underside of a member 13 in which the slot is formed enables the cover to be lifted out of the frame by the lifting key. Each member 11 is internally threaded at its upper end to accommodate a screw cap 14 which has a slot 15 therein for engagement by a screw-driver. The screw cap 14 prevents the tubular member 11 from becoming filled up with dirt or rubbish when the cover is in position in a floor and it also presents a pleasing appearance. A hole 16 is formed in the base 36 at the bottom of the tube 11 so that a threaded bolt can have its end passed through the hole 16 to engage a threaded nut 17 welded to a bracket 18 which is welded to the supporting frame 1, in order to lock the cover in the frame. This locking bolt can only be operated by inserting a box spanner into the tube 11 after first having removed the screw cap 14. Other types of locking means may be provided such as the simplified device 29 shown in Figures 3 and 5. The cover is also pressed from steel plate and has its sides 6 welded together at the corners. The screw cap 14 and top of the tube 11 are preferably made from a non-ferrous metal such as brass. The locking bolt is also preferably made of a non-ferrous metal.

Referring to Figures 3, 4 and 5; these show an alternative construction of frame and cover embodying the present invention. In this embodiment the frame 1 has two sides 19 of corrugated cross-section similar to the sides of the frame shown in Figures 1 and 2, but the other two sides 20 are substantially plane. The sides 19 and 20 are pressed from steel plate and are secured together by bolts 22 which pass through the plane sides 20 and flanges 21 secured to the ends of the corrugated sides 19, to engage with nuts 23. The corrugated sides 19 have metal rods 24 in the form of feet welded thereto to provide means for anchoring the frame in the concrete floor or the like in which it is to be located. The plane sides 20 also have metal rods 25 for the same purpose.

The cover has two sides 27 of corrugated cross-section and two plane sides 28 so that it will nest in the frame without rocking. The cover is also provided with two lifting key bosses 29 of simplified construction having a slot in the top, as shown in Figure 5, for the insertion of a lifting key, and there are also a number of rods 30 extending across the flat base 31 of the cover and spaced therefrom to provide keying for the infill material. Alternatively the lifting bosses 10 shown in Figures 1 and 2 may be used. The cover is also pressed from steel plate.

It should be appreciated that the cover and frame may be made in shapes other than rectangular, depending on the shape of the opening which it is desired to cover. The sides of the frame may either be welded or bolted together, the sides of the cover being preferably welded since bolts would form undesirable projections which may hinder the nesting of the cover in the frame.

In use, the supporting frame is set round the opening in the floor or the like with the upper edges of its sides level with the surrounding floor surface. The cover is then laid in the supporting frame and can then be filled with the same material as the floor. After the cover has been filled the only parts of the cover and frame which are visible are the thin upper edges of the vertical upper portions of the sides of the cover and frame and the screw caps or tops of the key bases. These visible edges may be provided with brass strips or other non-ferrous material either brazed or otherwise secured thereto in order to give the cover a pleasing appearance.

By providing the cover with a solid base it can be filled while in position in the frame, thereby saving the labour and expense involved in having to move heavy covers already filled from the place of filling to the supporting frame.

Furthermore, due to the slight flexibility of the cover and frame it is possible to adjust the frame during the installation to eliminate any tendency for the cover to rock. Also when the cover is being filled it will adjust itself very slightly to the frame to ensure a non-rocking fit.

Due to the combination of the corrugated sides and the steel plate base, additional strength is achieved over and above what would normally be expected from the usual type of recessed steel tray of similar size.

The whole cover and frame with the exception of the non-ferrous parts is preferably processed by a zinc spray or by hot dip galvanizing against corrosion.

WHAT WE CLAIM IS:—

1. A manhole or like cover and supporting frame wherein said frame is in the form

of a closed figure and has one or more of its sides downwardly and inwardly inclined towards the centre thereof, and of corrugated cross-section and said cover is of a similar shape and is in the form of a tray having the side or sides corresponding to the said corrugated side or sides of said frame also similarly downwardly and inwardly inclined towards the centre thereof, and similarly corrugated to allow said cover to nest in said frame without rocking, said cover having a substantially solid flat base to support an infill material, and said cover and frame being formed from metal plate by rolling or pressing, the upper portions of the sides of said cover and frame being substantially upright so that only the narrow edge of said metal plate comprising said sides is visible when said cover is filled with said infill material.

2. A manhole or like cover and supporting frame as claimed in claim 1 wherein said cover and frame are rectangular and with each of their sides of said corrugated cross-section.

3. A manhole or like cover and supporting frame as claimed in claim 1 wherein said cover and frame are rectangular and each has one pair of parallel sides of said corrugated cross-section and the other pair of parallel sides substantially plane.

4. A manhole or like cover and supporting frame as claimed in any previous claim wherein said cover has one or more lifting key bosses for engagement by a key to enable said cover to be lifted out of said supporting frame.

5. A manhole or like cover and supporting frame as claimed in claim 4 wherein one or more of said lifting key bosses is or are provided with means for locking said cover in said frame, said means comprising a threaded nut attached to said frame and engageable by a threaded bolt which passes through a hole formed in the said flat base of said cover at the bottom of said keyhole boss.

6. A manhole or like cover and supporting frame as claimed in any previous claim wherein said cover has a plurality of rods extending across said flat base and spaced apart therefrom to provide keying for said infill material.

7. A manhole or like cover and supporting frame as claimed in any previous claim wherein said sides of said supporting frame have projecting members thereon or secured thereto for anchoring said frame in the material of the floor or the like in which said frame is set.

8. A manhole or like cover and supporting frame substantially as particularly described with reference to either Figures 1 and 2 or to Figures 3, 4 and 5 of the accompanying drawings.

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PROVISIONAL SPECIFICATION

Improvements in Manhole or Like Covers and Frames

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The present invention relates to improvements in manhole or like covers and frames.

It has been proposed to form a manhole or the like access cover and supporting frame from metal sheet in order to make them light in weight and easy to manufacture by pressing or rolling. It has also been proposed to form a manhole or like access cover which can be filled with any desired material or infill in order to blend with the surrounding floor or like surface in which said cover and frame are situated.

The present invention is concerned with providing a cover and frame of the aforementioned kind in which the cover can be filled with said infill while it is in position in its supporting frame, the present invention constituting an improvement on the frame and cover described in our earlier Patent No. 606,014.

According to the present invention in a manhole cover and supporting frame said frame has at least some of its sides of corrugated cross section and said cover is in the form of a tray having the sides corresponding to the corrugated sides of said frame also corrugated to allow said cover to rest in said frame without rocking, said cover having a substantially flat base which serves to support said infill.

An embodiment of the invention will now be described by way of example only.

The frame for supporting the access cover is preferably rectangular and has its sides sloping down towards the opening around which said frame is to be located, the sides of said frame being corrugated in cross section with the outer edge of each side substantially upright. The frame has a plate welded across the bottom of each corner to form a projection which serves as a keying member to secure said frame in the concrete floor or the like in which said frame is to be

located. Other forms of keying member may be employed such as rods welded in the form of feet at each corner.

The cover is in the form of a tray and has a flat rectangular base, which is substantially the same size as the opening to be covered, said base having sides which incline outwardly therefrom and which sides are of substantially the same cross sectional shape as the sides of said frame so that said cover rests within said frame. There is however a slight difference in shape so that a space is formed between the sides of said frame and cover which space can accomodate grease to provide an airtight seal between the cover and frame. The cover and frame are pressed from metal plate of say 12 s.w.g. thickness.

The cover has rods welded across and spaced apart from the upper surface of its flat base to provide keying means for the material with which the cover is intended to be filled. The cover is also provided with one or more means whereby it can be lifted out of said supporting frame. This lifting means comprises a tubular member which extends upwardly from the base of said cover, said tubular member preferably having the top part furnished in brass or other non-ferrous material and having a slot formed near the top end thereof. The top of the tubular member is level with the outer edge of the sides of said frame and said cover. The slot is shaped so that a key can be inserted therein and when turned will bear against the underside of the slotted member, so making it possible to lift said cover. The cover is preferably provided either with two or four such keyholes according to size, one or two at each of the shorter ends of said cover, thereby making it possible to easily slide the cover out of the frame by either end. The top of said tubular member is preferably provided with a screw cap also preferably of brass or non-ferrous material which prevents the entry and accumulation of dirt in the keyhole and also presents a pleasing appearance in the furnished floor of the device. Other types of keyhole may of course be provided.

The cover may be provided with means for locking the cover in the frame. For this purpose a hole is formed in the portion of the base of the cover which is inside said tubular member thereby allowing a screw preferably non-ferrous to pass through said hole and engage with a threaded nut which is welded to a plate which projects substantially horizontally from the bottom edge of the side of the frame. This locking screw can only be operated by inserting a box spanner into said tubular member after first having removed said threaded cap. Where such locking means are desired the cover is preferably provided with one such means at each corner thereof.

Although the cover and frame described have all four sides of substantially the same corrugated cross section, the ends, for example, may be made plane and only the sides made of corrugated shape for nesting purposes. It will also be appreciated that the cover and frame may be made in shapes other than rectangular depending on the shape of the opening which it is desired to cover. The members forming the sides of the frame may either be welded together or bolted, the sides of the cover being preferably welded since bolts would form undesirable projections which may hinder the nesting of the cover in the frame.

In use, the supporting frame is set round the opening in the floor or the like with the upper edge of its sides level with the surrounding floor surface. The cover is then laid in the supporting frame and can then be filled with the same material as that of the floor. After the cover has been filled the only parts of the cover and frame which are visible are the thin upright edges of the sides of the cover and frame and the said threaded caps covering the tubular keyhole members. These visible edges may be provided with brass strips or other non-ferrous material either brazed or otherwise secured thereto in order to give the cover a pleasing appearance.

By providing the cover with a solid base it can be filled while in position in the frame, thereby saving the labour and expense involved in having to move heavy covers already filled from the place of filling to the supporting frame.

Further, due to the slight flexibility of the cover and frame it is possible to adjust the frame during the installation to eliminate any tendency for the cover to rock. Also when the cover is being filled it will adjust itself very slightly to the frame to ensure a non-rocking fit.

Due to the combination of the corrugated sides and the steel plate base additional strength is achieved, over and above what would normally be expected from the usual type of recessed steel tray of similar size.

The whole with the exception of the non-ferrous parts is processed, preferably by a zinc spray or by hot dip galvanizing against corrosion.

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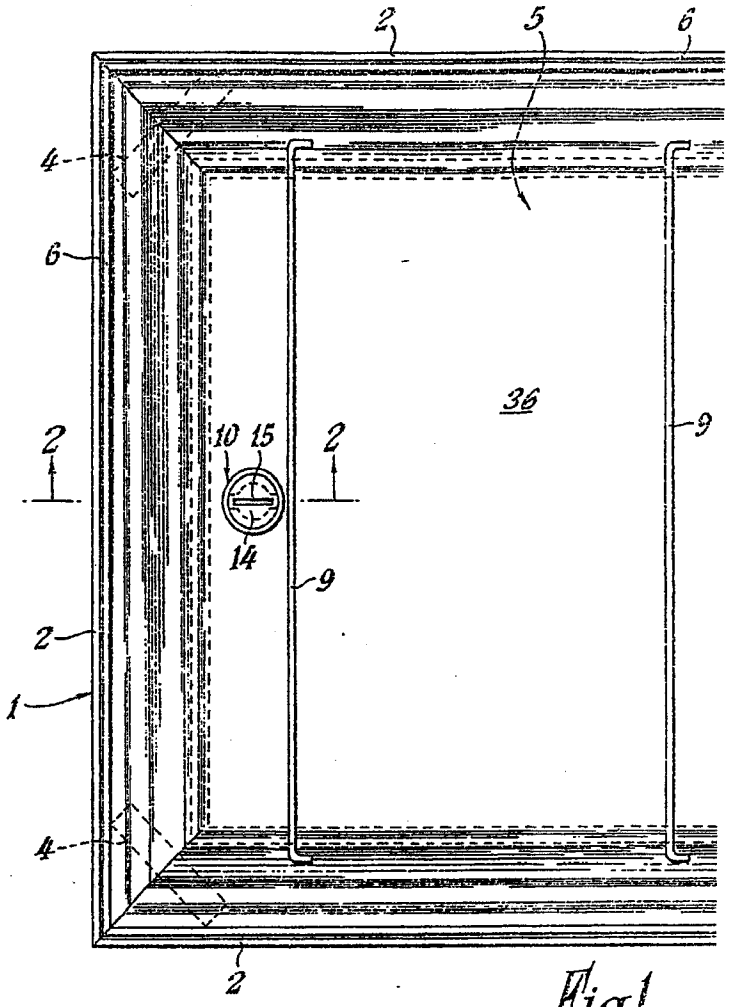
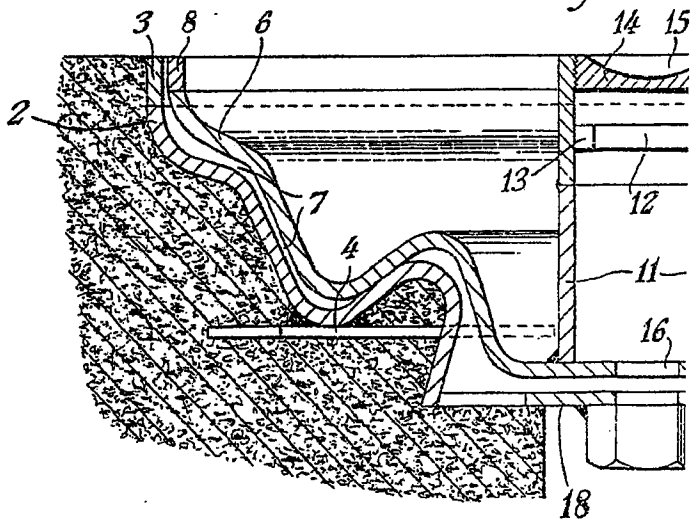


Fig. 1.



902.650 COMPLETE SPECIFICATION

2 SHEETS

This drawing is a reproduction of the Original on a reduced scale.

SHEET 1

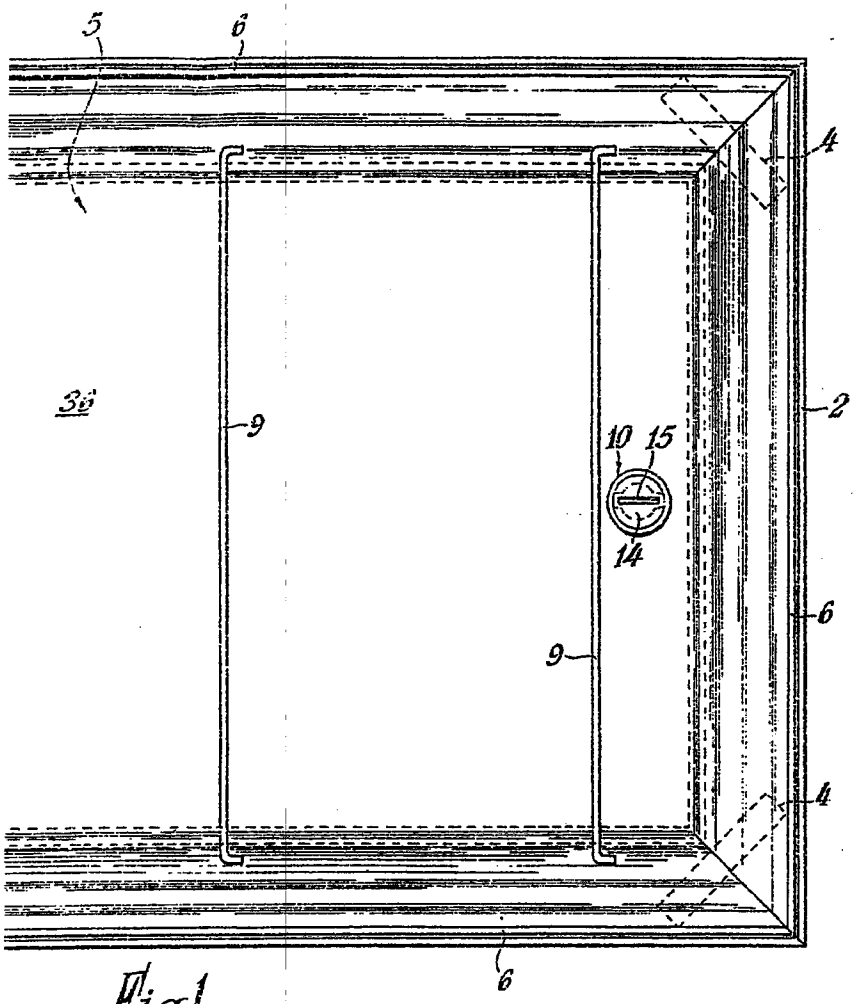


Fig.1.

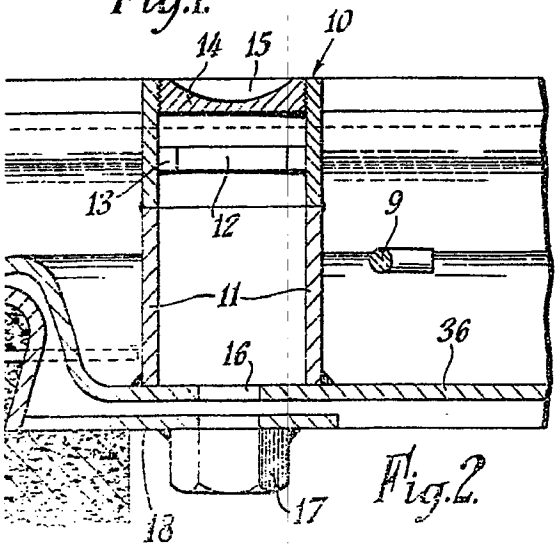


Fig.2.

902,650 COMPLETE SPECIFICATION
2 SHEETS
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SHEET 1

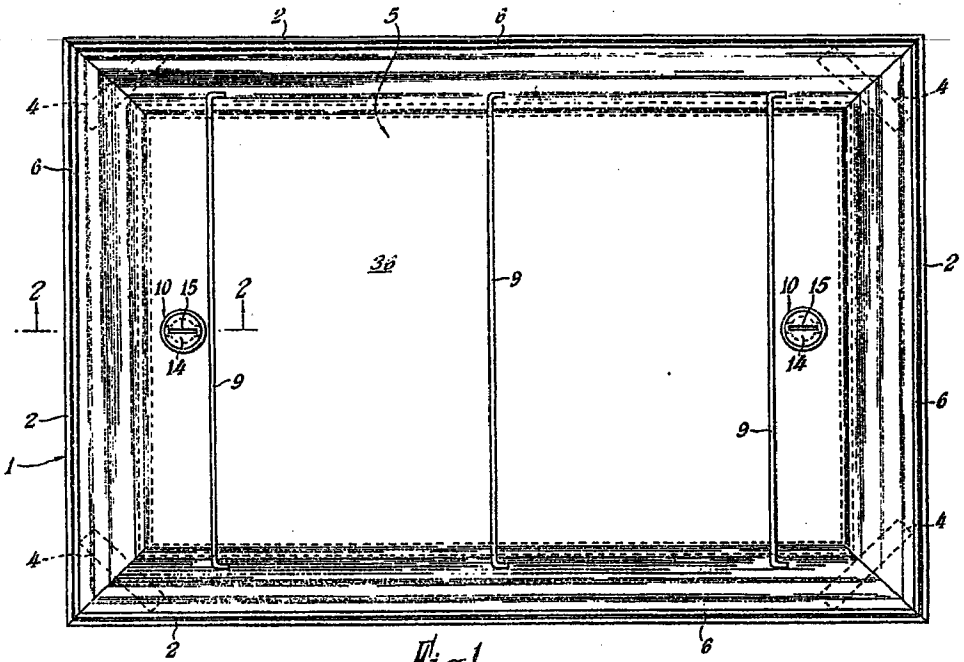

Fig.1.

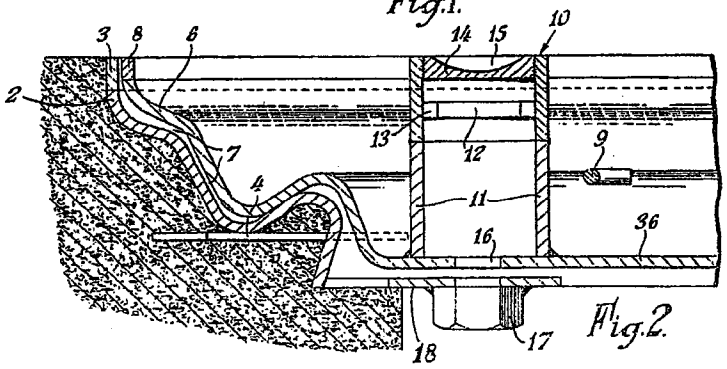

Fig.2.

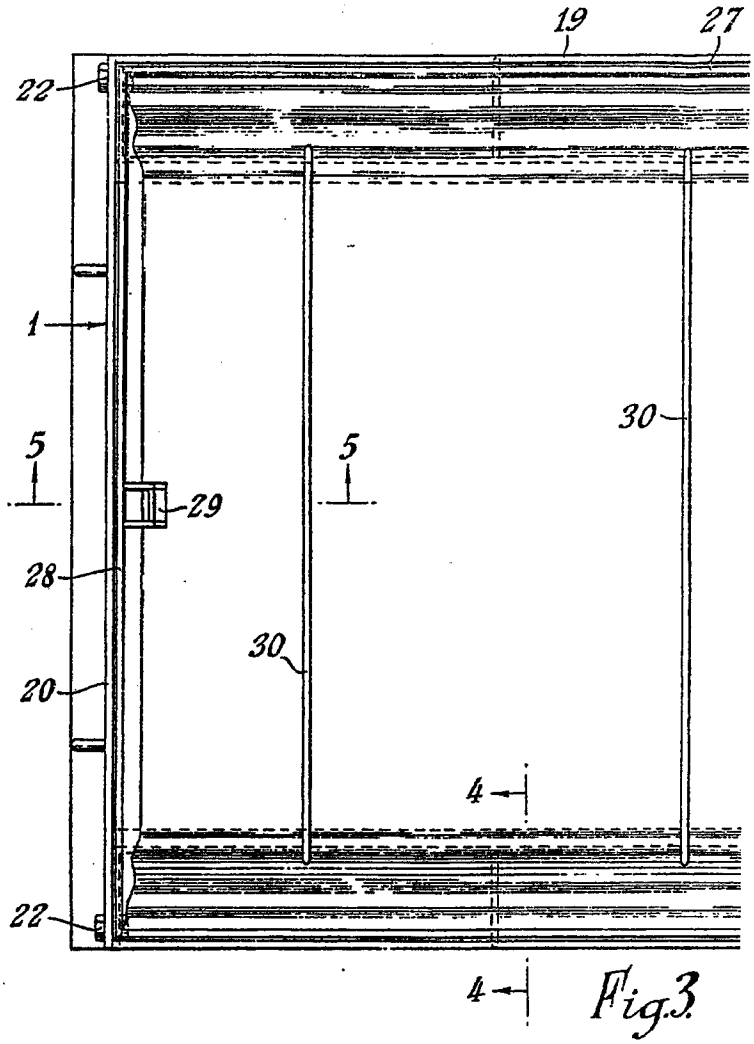

Fig.3.

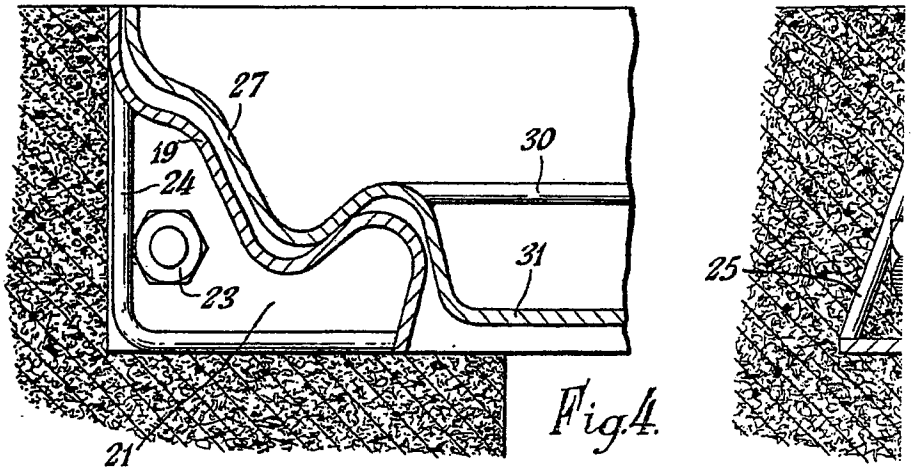

Fig.4.

902,650 COMPLETE SPECIFICATION

2 SHEETS

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SHEET 2

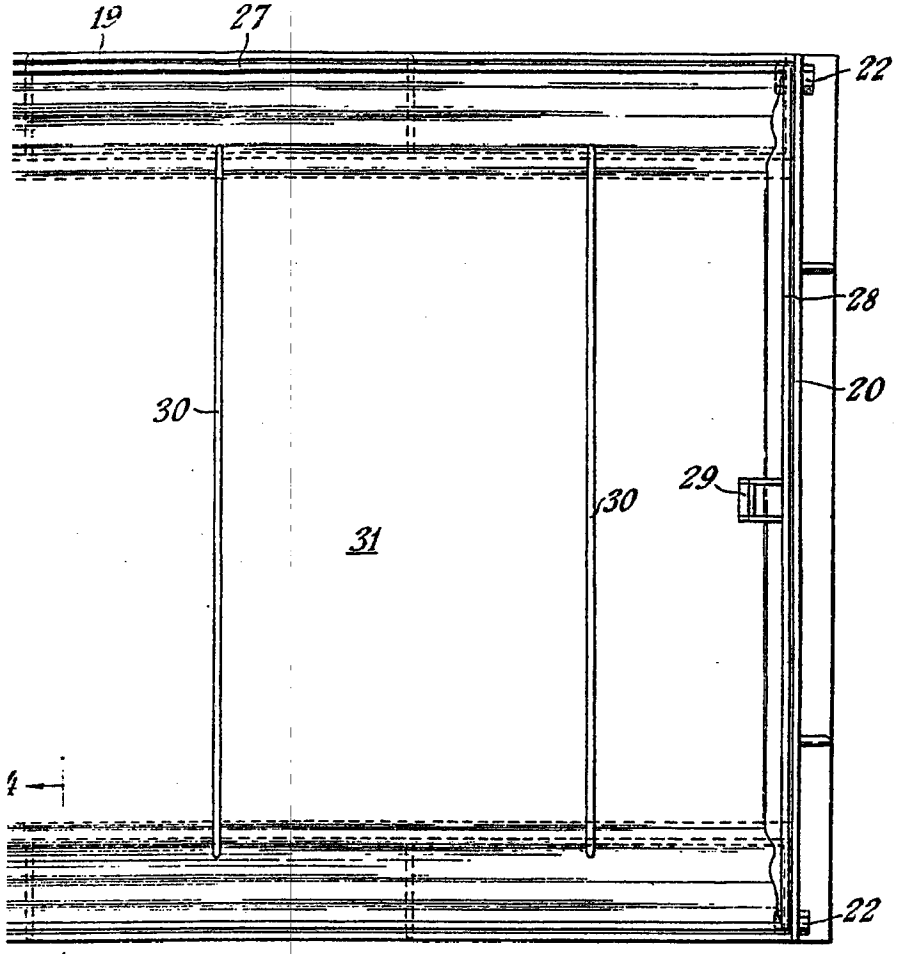

Fig.3.

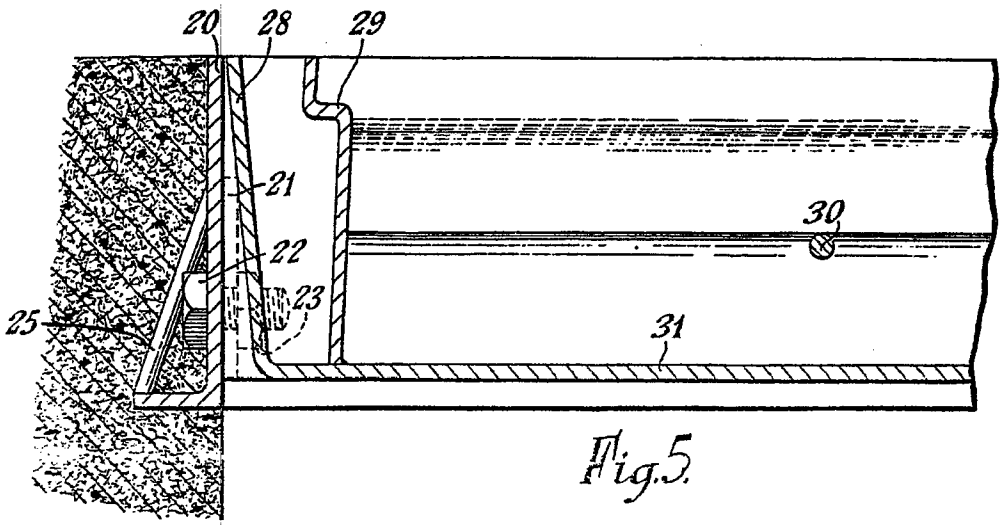

Fig.5.

902,650 COMPLETE SPECIFICATION
2 SHEETS
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SHEET 2

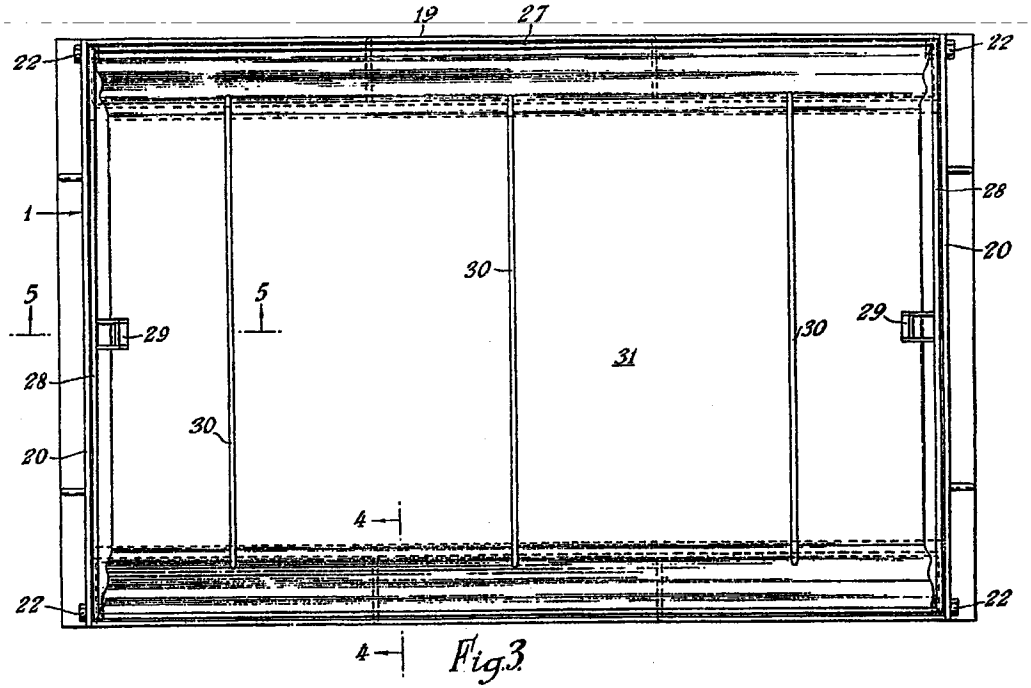

Fig.3.

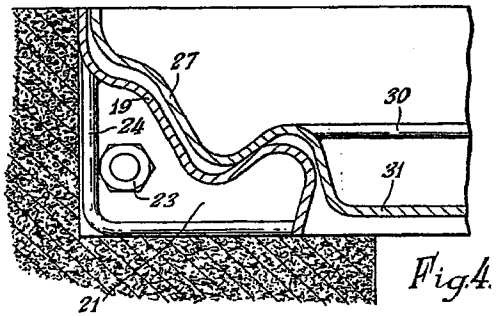

Fig.4.

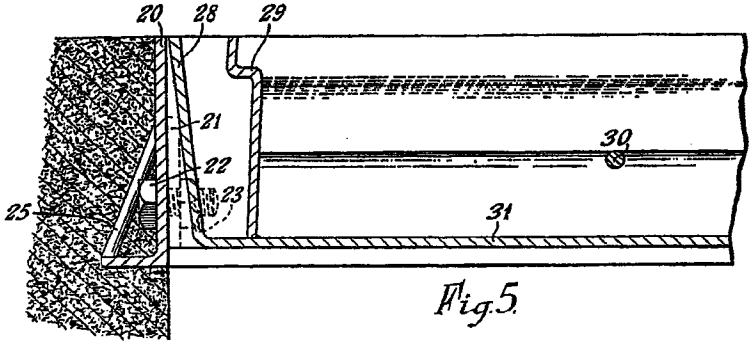

Fig.5.